AMENDING THE ATOMIC ENERGY ACT AND AUTHORIZATION OF STANFORD ACCELERATOR PROJECT

THE UNIVERSITY OF MICHIGAN
SEP 17 1959
MAIN READING ROOM

HEARING

BEFORE THE

JOINT COMMITTEE ON ATOMIC ENERGY CONGRESS OF THE UNITED STATES

EIGHTY-SIXTH CONGRESS

FIRST SESSION

ON

BILLS TO AMEND SECTIONS 91, 161, AND 163 OF THE ATOMIC ENERGY ACT (S. 2569—H.R. 8754) AND TO AUTHORIZE STANFORD LINEAR ACCELERATOR PROJECT (S. 2073—H.R. 7464)

AUGUST 26, 1959

Printed for the use of the Joint Committee on Atomic Energy

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BILLS TO AMEND SECTIONS 91, 161, AND 163 OF THE ATOMIC ENERGY ACT AND AUTHORIZATION OF STANFORD LINEAR ACCELERATOR

WEDNESDAY, AUGUST 26, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The Joint Committee met, pursuant to notice, at 10:10 a.m., in room F-88, the Capitol, Hon. Clinton P. Anderson (chairman of the Joint Committee) presiding.

Present: Senators Anderson, Jackson, Hickenlooper, Dworshak, Aiken, Bennett; Representatives Price, Van Zandt, Hosmer, and Westland.

Present also: James T. Ramey, executive director, John T. Conway, assistant director, David R. Toll, staff counsel, G. Edwin Brown, Jr., and George F. Murphy, Jr., professional staff members, Edward J. Bauser, technical adviser, Richard T. Lunger, staff consultant, Joint Committee on Atomic Energy.

Representing the Atomic Energy Commission: John A. McCone, Chairman; Gen. A. R. Luedecke, General Manager; Charles Manly, Reactor Development Division; Don Burrows, Comptroller; Neil D. Naiden, Deputy General Counsel; Robert Lowenstein, Office of the General Counsel; Edward Bloch, Director, Division of Production; Curtis A. Nelson, Director of Inspection; Richard X. Donovan, congressional liaison; R. E. Hollingsworth, Assistant General Manager for Administration; Col. John Hood, Division of Military Application; and Sam Goldenburg.

Representing the Department of Defense: Gen. Herbert B. Loper, Assistant Secretary of Defense for Atomic Energy, and Col. Willard M. Shankel, USAF, assistant to General Loper.

Chairman ANDERSON. The committee will be in order.

The Joint Committee on Atomic Energy is meeting this morning to receive comments by Atomic Energy Commission and Department of Defense representatives on bills which the Commission has requested the Joint Committee to consider further this session.

The bills are S. 2569 and H.R. 8754, introduced by myself and Mr. Durham to amend sections 91, 161, and 163 of the act.

We have invited the AEC to comment on these bills, and the DOD to comment on section 1 of the bill which concerns the DOD.

I understand that Mr. McCone also desires to say a few words in support of S. 2073 and H.R. 7464, the bills pending before the committee to authorize $105 million for the construction of the Stanford linear electron accelerator.[1]

[1] See also Hearings on Stanford Accelerator, July 14–15, 1959.

Mr. McCone, we are very happy to have you with us this morning. I understand you have some time limitations, so when you reach the stage where you have to leave, you may do so.

(The bill referred to follows:)

[S. 2569 [H.R. 8754], 86th Cong., 1st sess.]

A BILL To amend the Atomic Energy Act of 1954, as amended

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 91 of the Atomic Energy Act of 1954, as amended, is amended by adding the following subsection d.:

"d. Notwithstanding any other provision of this Act, in the event there is a delivery to the Department of Defense, pursuant to subsection b. (1) of this section, or manufacture, production, or acquisition by the Department of Defense, pursuant to subsection b. (2) of this section, in accordance with a directive issued by the President under subsection b. of this section, the President may, to the extent he deems necessary in the national interest, authorize the Department of Defense to establish and prescribe standards or instructions applicable to special nuclear material or atomic weapons so delivered or atomic weapons or utilization facilities so manufactured, produced, or acquired, in order to protect health and minimize danger to life or property."

SEC. 2. Subsection 161 m. of the Atomic Energy Act of 1954, as amended, is amended by striking out "Section 103 or 104" and inserting in lieu thereof "Section 103, 104, 53 a. (4), or 63 a. (4)".

SEC. 3. Section 163 of the Atomic Energy Act of 1954, as amended, is amended by inserting after the words "from receiving compensation" the following words "from a source other than a nonprofit educational institution".

STATEMENT OF JOHN A. McCONE, CHAIRMAN, ATOMIC ENERGY COMMISSION

Mr. McCONE. Mr. Chairman and members of the committee, the Commission has been requested to comment this morning on S. 2569 and H.R. 8754 which would amend three sections of the Atomic Energy Act of 1954, as amended. We believe that all the proposed amendments will aid the Commission in carrying out its assigned responsibilities and, at the same time, keep the Atomic Energy Act of 1954 current within the ever-changing developments in the field of atomic energy.

While members of the Commission staff present here this morning are prepared to discuss in more details the various amendments contained in the proposed legislation, I would like, with your permission to introduce into the record at this time an analysis of sections 1 and 2 in addition to the report on section 1 (to amend sec. 91) filed with the Joint Committee yesterday afternoon. Further I would like to review briefly section by section, the three amendments which are the subject of S. 2569 and H.R. 8754. This analysis has been presented to the staff and I would like to introduce it into the record.

Chairman ANDERSON. Very well.

(The documents follow:)

REPORT BY THE U.S. ATOMIC ENERGY COMMISSION ON SECTIONS 1 AND 2 OF S. 2569 (H.R. 8754)

Section 1.—Section 1 of S. 2569 and H.R. 8754 would add a new subsection to section 91 of the Atomic Energy Act.

This subsection would specifically authorize the President, to the extent he deems necessary in the national interest, to authorize the Department of Defense to establish and prescribe standards and instructions—applicable to special nuclear material or atomic weapons delivered to the Department pursuant to

section 91 b., or to atomic weapons or utilization facilities manufactured, produced, or acquired by the Department pursuant to that subsection—in order to protect health and minimize danger to life or property.

The Commission recommends enactment of this section of S. 2569 or H.R. 8754.

The current provisions of the Atomic Energy Act of 1954, as amended, do not specify clearly whether the Atomic Energy Commission or the Department of Defense has responsibility for public health and safety with respect to weapons and special nuclear material, and reactors transferred or acquired by DOD pursuant to section 91 b. of the act. Neither do they expressly authorize the transfer of such responsibility from one agency to the other. For example, sections 161 b. and i. charge AEC with responsibility for issuing rules and regulations dealing with public health and safety and the protection of property with respect to possession and use of special nuclear material as well as any activity authorized by the act. Nothing in the act expressly exempts the Department of Defense from such rules and regulations. However, pursuant to section 91 b. the President may direct the Commission to deliver special nuclear material or atomic weapons to the Department of Defense for "such use as he deems necessary in the interest of national defense." In this situation, health and safety standards which AEC might promulgate under section 161 could make it impossible, without violating such standards and instructions, for DOD to put transferred weapons or special nuclear material to that use which the President has indicated is necessary in the interest of national defense. Read together, the above sections are susceptible of at least the following interpretations: (1) Since the President may direct the delivery of weapons or special nuclear material to the Department of Defense for a use he deems necessary in the interest of national defense, he may also, notwithstanding sections 161 b. and 161 i., charge the DOD with responsibility for establishing health and safety standards compatible with such use; or (2) sections 161 b. and i. place statutory responsibility upon the AEC to promulgate health and safety standards applicable to any use of special nuclear material, including use of such material which has been transferred to the DOD pursuant to a Presidential directive under section 91 b.

Our current practice in the weapons field has been in accordance with the first interpretation. However, during the hearings before this committee April 11, 1959, on the *Skipjack*, members of the committee indicated that this interpretation was not the intent of the statute.

With respect to special nuclear material transferred to DOD pursuant to section 91 b. for use in reactors, our practice has been to regard the responsibility for establishing health and safety standards as having been transferred by interdepartmental agreements. For example, AEC and DOD entered into an agreed statement of policy for operation of military power reactors, dated November 8, 1954. The essence of that agreement is that AEC responsibilities (both with respect to operation of the reactor and for public health and safety) end at the moment of transfer but that AEC will, at DOD's request, provide advice and assistance to DOD. In practice, a review of the reactor design by ACRS and its comments and recommendations are furnished DOD.

Neither the statement of policy nor the individual memoranda of understanding limits in any way the responsibility assumed by the military departments for establishing and enforcing safety procedures. For example, the Navy Department would be responsible for establishing safety procedures applicable to naval propulsion reactors while they are in port as well as while they are at sea.

If, in fact, the second interpretation mentioned above is correct, the Commission would seem to have the authority, notwithstanding existing agreements with the DOD, to establish health and safety standards which DOD in turn might find incompatible with the use to which the material transferred was to be put.

The lack of certainty as to the agency responsible under the statute could lead to confusion and disagreements in this potentially quite hazardous area.

Section 1 of S. 2569 provides a flexible method for establishing responsibility in this area. That section provides the President with specific authority to designate those areas in which DOD will be responsible. It also provides flexibility since the President, under appropriate circumstances, could allocate responsibility between AEC and DOD with respect to different phases of military utilization of property transferred pursuant to section 91 b., or could require that health and safety standards be established with the assistance of the

Commission or by agreement between the Commission and the Department of Defense.

Section 2.—Section 161 m. of the Atomic Energy Act authorizes the Commission, among other things, to enter into agreements with persons licensed under sections 103 and 104, and only these, for such periods of time as the Commission may deem necessary or desirable for the purpose of providing for the processing, fabricating, separating or refining in facilities owned by the Commission of source, byproduct or other material, or special nuclear material owned by or made available to such licensee and which is utilized or produced in the conduct of the licensed activity. It is proposed by section 2 that section 161 m. be expanded to include persons licensed under sections 53 a. (4) or 63 a. (4) in order to make available to licensees, other than those holding a section 103 or 104 license, the services now authorized under section 161 m. We recommend enactment of this amendment.

When the Atomic Energy Act of 1954 was enacted, it was conceived that most of the services rendered by the Commission because of commercial unavailability would be furnished directly to the reactor operators who would be licensed under section 103 or 104. This was understandable in the light of the then unavailability commercially of any significant service to reactor designers and builders. It was thought that whenever a reactor group needed a service, such as conversion of UF_6 to metal or oxide, fuel-element fabrication, scrap recovery, or chemical processing of irradiated fuel, the reactor group would deal directly with the Commission. However, the Commission assisted and witnessed the growth of an industry capable of performing many of the services previously furnished by the Commission.

At the present time, almost all steps in the fuel cycle are available commercially except the chemical processing of irradiated fuel. The Commission has offered to perform this service under the conditions published in the Federal Register of March 12, 1958 (22 F.R. 1591). However, because of the limitations of section 161 m., the service can be offered on a long-term basis only to section 103 or 104 licensees.

A natural outgrowth of industry's performing an increasing portion of the fuel cycle is the "package arrangement" whereby a given fuel cycle supplier, not a section 103 or 104 licensee, would furnish or arrange for all steps in the fuel cycle for a given reactor operator. This possibility might include financial responsibility for fuel in some instances. Part of the services rendered under the package arrangement would be contracting with AEC for chemical processing of the spent fuel. However, before such an arrangement can take place, section 161 m. must be broadened to allow AEC to contract with fuel-cycle suppliers who would be section 53 a. (4) licensees in the case of special nuclear material, or section 63 a. (4) licensees in the case of source material.

The package arrangements have a number of advantages, both financial and administrative, to the reactor operator, to the fuel-cycle supplier, and to the Commission. First, the reactor operator receives a complete service under a single arrangement rather than having to become involved in multiple arrangements for the fueling of his reactor. There have been repeated statements by utility companies engaged in the building of power reactors of the importance to the utilities of having their responsibilities limited to the reactors, and the desirability of having such services as the fuel package provided by others. Second, under the Commission's present chemical processing policy, there would be considerable merit, especially in the case of small reactors, in having the fuel from a number of reactors delivered in a single batch to the Commission for processing. The most convenient manner in so doing would be to have a middleman accumulate the fuel under a section 53 a. (4) or a section 63 a. (4) license at his own financial responsibility and deliver to AEC for his own account. Third, the Commission would benefit through the need for fewer chemical processing contracts, which not only saves administrative expense, but also handling expense, analytical services, and the like.

REPORT OF U.S. ATOMIC ENERGY COMMISSION ON SECTION 91 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

This report has been prepared in conjunction with the Commission's review of section 1 of S. 2569 and H.R. 8754.

Section 1 of S. 2569 and H.R. 8754 would add a new subsection to section 91 of the Atomic Energy Act.

This subsection would specifically permit the President to the extent he deems necessary in the national interest, to authorize the Department of Defense to establish and prescribe standards and instructions—applicable to special nuclear material or atomic weapons delivered to the Department pursuant to section 91 b. or to atomic weapons or utilization facilities manufactured, produced, or acquired by the Department pursuant to that subsection—in order to protect health and to minimize danger to life or property.

The current provisions of the Atomic Energy Act of 1954, as amended, do not clearly specify whether the Atomic Energy Commission or the Department of Defense has responsibility for public health and safety with respect to weapons and special nuclear material transferred to DOD pursuant to section 91 b. of the act. Neither do they expressly authorize the transfer of such responsibility from one agency to the other. It is believed that this lack of certainty could lead to problems in certain areas which are significant not only to the two agencies involved but to the general public as well. These potential problem areas are identified and discussed below.

STATUTORY PROVISIONS

The special nuclear material and atomic weapons involved are those transferred to the Department of Defense pursuant to section 91 b. of the act, which provides as follows:

"b. The President from time to time may direct the Commission (1) to deliver such quantities of special nuclear material or atomic weapons to the Department of Defense for such use as he may deem necessary in the interest of national defense, or (2) to authorize the Department of Defense to manufacture, produce, or acquire any atomic weapon or utilization facility for military purposes: *Provided, however,* That such authorization shall not extend to the production of special nuclear material other than that incidental to the operation of such utilization facilities."

This section does not specifically authorize placing authority in the Department of Defense for establishing standards to protect health and safety.

Other sections of the act authorize AEC to exercise broad powers in the protection of public health and safety. For example, section 161 provides:

"SEC. 161. GENERAL PROVISIONS.—In the performance of its functions the Commission is authorized to—

* * * * * * *

"b. establish by rule, regulation, or order, such standards and instructions to govern the possession and use of special nuclear material, source material, and byproduct materials as the Commission may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property;

* * * * * * *

"i. prescribe such regulations or orders as it may deem necessary * * * (3) to govern any activity authorized pursuant to this Act, including standards and restrictions governing the design, location, and operation of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property."

Section 110b. also related to this matter. That section provides:

"SEC. 110. EXCLUSIONS.—Nothing in this chapter shall be deemed—

* * * * * * *

"b. to require a license for the manufacture, production, or acquisition by the Department of Defense of any utilization facility authorized pursuant to section 91, or for the use of such facility by the Department of Defense or a contractor thereof."

This section (sec. 110) expressly exempts from AEC's licensing requirements any reactor acquired by DOD pursuant to section 91b. But the act provides no such exemption with respect to special nuclear material transferred from REC to DOD pursuant to section 91b., even where such material is to be used in the operation of a reactor. However, the Commission in part 7013 of its regulations has exempted special nuclear material so transferred from Commission licensing requirements.

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HISTORY AND CURRENT PRACTICE

General

Pursuant to Presidential directives issued from time to time under section 91b. and its predecessor, section 6(a) of the Atomic Energy Act of 1946, AEC has delivered to DOD both atomic weapons and special nuclear material. The purpose of the transfer of the weapons was to place DOD in a state of operational readiness in the event of an enemy attack. The special nuclear material has been transferred for use in (*a*) land-based research and development reactors, (*b*) naval propulsion reactors, (*c*) other research and development activities, and (*d*) radiation detection devices.

Weapons

Prior to 1956, Presidential directives ordering the transfer of weapons did not deal with the question of responsibility for public health and safety. Since that time, however, such directives have provided that DOD would be responsible for the security and safety of transferred weapons. The intent of this provision, among other things, was that transfer of the weapons to DOD would carry with it, as to such weapons, the responsibility for public health and safety and the protection of property. Thus, in this case DOD has been charged with the responsibility for developing and enforcing rules and standards for public health and safety with respect to the handling, storage, and transportation of, and training with and tactical use of, transferred weapons.

In this connetcion, both AEC and DOD are faced with the problem of safety in connection with the handling, storage, and transportation of atomic weapons, but only DOD is confronted with the safety problem with respect to tactical use of and training with such weapons. Procedures to insure safe handling of weapons are included in detailed handling instructions prepared by an AEC contractor, usually Sandia Corp. Under current practice, these procedures are adopted by the military departments and reissued as military safety procedures. Safety precautions applicable to storage and transportation are studied by boards composed of AEC and DOD representatives, acting with the advice of contractor and laboratory experts. These boards prepare and recommend safe storage and transportation procedures and practices to AEC and DOD. In every case to date, such procedures and practices have been adopted by both AEC and DOD. Accordingly, in the areas of handling, storage, and transportation of weapons, AEC and DOD follow the same safety rules.

Safety procedures and regulations which cover training with and tactical use of atomic weapons are issued by DOD. However, the military department concerned now seeks and obtains the advice and assistance of AEC's Albuquerque Operations Office and contractors in preparing these procedures and regulations; and the Commission is asked by DOD to comment on them. To the best of our knowledge DOD has not rejected any revision which has been suggested by AEC in the interest of public health and safety.

Special nuclear material

Presidential directives dealing with the transfer of special nuclear material to DOD (whether for use in reactors, research and development, or radiation detection devices) have not contained provisions concerning the responsibility for public health and safety. However, the practice has been to rely upon the military department concerned to establish necessary safety procedures.

For example, AEC and DOD entered into an agreed statement of policy for operation of military power reactors, dated November 8, 1954. The essence of that agreement is that AEC responsibilities (both with respect to operation of the reactor and for public health and safety) end at the moment of transfer but that AEC will, at DOD's request, provide advice and assistance to DOD. In practice, a review of the reactor design by ACRS and its comments and recommendations are furnished DOD.

Also, both before and since the formal statement of policy, there have been memorandums of understanding between AEC and the military department involved to cover each transfer to DOD of such a reactor and its special nuclear material. Each such memorandum of understanding has provided for the military department to assume responsibility for public health and safety at the time of transfer.

Neither the statement of policy nor the individual memorandums of understanding limits in any way the responsibility assumed by the military departments for establishing and enforcing safety procedures. For example, the Navy Department would be responsible for establishing safety procedures

applicable to naval propulsion reactors while they are in port as well as while they are at sea.

However, in this field as well as in the weapons field, those safety procedures which have been established by the military departments and furnished AEC for review have either been found adequate by AEC or have been revised to incorporate suggestions made by AEC.

IDENTIFICATION AND DISCUSSION OF POTENTIAL PROBLEM AREAS

The question basic to this entire matter may be stated simply as follows: Which agency, AEC or DOD, has the statutory responsibility for public health and safety with respect to atomic weapons and special nuclear material transferred to DOD pursuant to section 91b.? If AEC is the agency charged with this responsibility, there may be a further problem of enforcement. For example, the President may have Executive power to exclude AEC from military matters and jurisdiction.

Section 91b. does not state which agency shall be responsible for public health and safety with respect to atomic weapons and special nuclear material delivered to DOD. It does, however, provide that such deliveries shall be "for such use as he [the President] deems necessary in the interest of national defense."

Sections 161 b and i. charge AEC with the responsibility for issuing rules and regulations dealing with public health and safety, and the protection of property, with respect to possession and use of special nuclear material as well as "any activity" authorized pursuant to the act. Nothing in the act expressly exempts DOD from any such rules and regulations so issued.

The last clause of section 110 b. clearly exempts DOD from AEC's licensing requirements with respect to any reactor acquired by DOD pursuant to section 91 b. This may be read as preventing AEC through its licensing requirements, from frustrating "uses" deemed necessary by the President. It could also be read as exempting DOD from such licensing requirements, but not from compliance with public health and safety standards and regulations which might be promulgated by AEC under section 161 b.

Thus, it would appear that sections 91 b., 161 b., and i., and 110 b., when construed together, are susceptible of at least the following two alternative interpretations:

1. Since the President, pursuant to section 91 b., directs the delivery of atomic weapons or special nuclear material to DOD for a use he deems necessary in the interest of national defense, he may also, notwithstanding sections 161 b. and i., charge DOD with the responsibility for establishing and enforcing health and safety standards compatible with such use. Furthermore, even though a Presidential directive is silent on the matter of health and safety responsibilities, any such use which is inconsistent with AEC health and safety standards would be exempt from those standards. Or,

2. Sections 161 b. and i. give AEC the authority to promulgate health and safety standards and instructions which are applicable to any use of special nuclear material, including use of such material which has been transferred to DOD pursuant to a Presidential directive issued under section 91 b.

Conceivably, health and safety standards and instructions which AEC might promulgate under section 161 could make it impossible, without violating such standards and instructions, for DOD effectively to put transferred weapons or special nuclear material to that use which the President has indicated he deems necessary in the interest of national defense.

In other situations, compliance by DOD with AEC-promulgated standards and instructions could be accomplished consistent with the use deemed necessary by the President, but such compliance would be more costly and burdensome than compliance with standards considered adequate by DOD.

For either of these reasons, DOD might adopt standards and procedures, particularly in the weapons field, which are less stringent than those considered necessary by AEC. Under present practices, if this should happen, the DOD view would prevail (unless the President intervened). This is based on the theory, which has been followed in the weapons field, that (1) the President's express statutory authority under section 91 b. to direct transfer of weapons carries with it the implied authority to direct the transfer of responsibility for public health and safety as to the use of those weapons; and (2) in the weapons

directives the President has charged DOD with this responsibility. These conclusions are not consistent, however, with the views expressed by members of the Joint Committee on Atomic Energy during the hearings April 11, 1959, on the *Skipjack*.

Problems could also arise in the reactor field if DOD concluded it could not adopt public health and safety procedures and practices deemed necessary by AEC.

The legal effect of the provisions concerning responsibility for health and safety as set forth in the November 8, 1954, statement of policy and the above-mentioned memorandums of understanding, is, in view of the problem's history, not clear. Presumably, if AEC is ultimately responsible for public health and safety in this area, as was indicated during the April 11, 1959, hearings, and if it should become dissatisfied with health and safety standards established by DOD or its failure to establish standards, the Commission could abrogate the provision of a memorandum of understanding concerning responsibility for safety and establish safety standards under section 161.

However, such AEC standards, if followed by DOD, could conceivably frustrate the use which the President has indicated he deems necessary in the interest of national defense.

These problems will perhaps be highlighted in situations where one agency seeks to establish safety standards applicable to products which that agency does not control and did not manufacture. For example, a warhead manufactured by AEC may be used in training operations with missiles manufactured by one of the military departments, and would be married to the missile through use of equipment manufactured by the military department. Similarly, an AEC propulsion reactor may be integrated with a vessel or aircraft manufactured by one of the military departments. Experience has shown that in situations such as these, close cooperation between the two agencies in developing safety procedures is essential, since knowledge of capability and reliability of all components is necessary.

It can be anticipated that as atomic weapons, nuclear-propelled vessels and other military reactors in the custody of military departments become more numerous, the requirements of military readiness in training and maneuvering may exert more and more influence toward less restrictive safety procedures. Under such circumstances there should be no room for doubt as to which agency has the authority and responsibility for dealing with matters of public health and safety. The views expressed by members of the JCAE during the *Skipjack* hearings April 11, 1959, have cast doubt on the basic theory underlying practices currently followed by AEC and DOD in the weapons field. They also have cast doubt on the effectiveness of the existing arrangements between AEC and DOD in the reactor field.

CONCLUSION

The absence of clear and specific statutory provisions can lead to considerable confusion as to which agency is vested with responsibility and authority in this potentially quite hazardous area. In addition, it should be possible to identify for the public the responsible agency, and that agency should be accountable for safety standards which it adopts.

The basic problem, therefore, is the need for clarification as to which agency has the responsibility and authority in the field of public health and safety with respect to atomic weapons and special nuclear material transferred to DOD by AEC pursuant to a Presidential directive issued under section 91b. In our opinion, section 1 of S. 2569 and H.R. 8754 provides a desirable method for establishing such responsibility. Pursuant to section 1 of S. 2569 and H.R. 8754 the President will have specific authority to designate those areas in which DOD will be responsible. It also provides flexibility so that the President, under appropriate circumstances, could allocate responsibility between DOD and AEC with respect to different phases of military utilization of property transferred pursuant to section 91b.

Mr. McCONE. Section 1. The current provisions of the Atomic Energy Act of 1954, as amended, do not specify clearly whether the Atomic Energy Commission or the Department of Defense has responsibility for public health and safety with respect to weapons, special nuclear material, and reactors transferred to DOD pursuant to section 91b. of the act. Neither do they expressly authorize the President to transfer such responsibility from one agency to the other.

As you know, the Commission is charged with general responsibility for issuing rules and regulations dealing with public health and safety and the protection of property with respect to possession and use of special nuclear material. Nothing in the act expressly exempts the Department of Defense from such rules and regulations. However, pursuant to section 91b. the President may direct the Commission to deliver special nuclear material or atomic weapons to the Department of Defense for "such use as he deems necessary in the interest of national defense." In this situation, health and safety standards which AEC might promulgate under its general authority could make it impossible for DOD to put transferred weapons or special nuclear material to the use which the President has indicated is necessary in the interest of national defense.

Our current practice in the weapons field has been based on the conclusion that responsibility for safety was transferred to DOD with the weapons.

With respect to special nuclear material transferred to DOD pursuant to section 91b. for use in reactors our practice has been to regard the responsibility for establishing health and safety standards as having been transferred by interdepartmental agreements.

However, during hearings before this committee April 11, 1959, on the *Skipjack*, doubt was cast on the effectiveness of these practices. It was indicated at that hearing that the Commission, under the act, was always responsible for public health and safety.

The lack of certainty that now exists as to the agency responsible under the statute could lead to confusion and disagreement in this potentially quite hazardous area.

Section 1 of S. 2569 provides a flexible method for establishing responsibility in this area. That section provides the President with specific authority to designate those areas in which DOD will be responsible. It also provides flexibility since the President, under appropriate circumstances, could allocate responsibility between AEC and DOD with respect to different phases of military utilization of property transferred pursuant to section 91b., or could require that health and safety standards be established with the assistance of the Commission or by agreement between the Commission and the Department of Defense. Accordingly, the Commission recommends enactment of section 1 of S. 2569 and H.R. 8754.

Chairman ANDERSON. Mr. Chairman, if we have some questions on section 1, do you want to answer them now or do you wish to wait? We would like to get the Department of Defense in it, too, when we get to it.

Mr. MCCONE. Would it be agreeable if I just run through this statement first?

Chairman ANDERSON. Yes.

Mr. MCCONE. Section 2. This section of the proposed bill is directed toward another problem which we would like to have solved by this session of Congress.

At present we are authorized to contract only with licensed reactor owners to perform services for them, such as chemical processing of their irradiated fuels. These services are not available from commercial suppliers.

This limited authority is interfering with the pattern of doing business preferred by reactor operators. For example, one large utility has told us that they prefer to contract with a fuel supplier who would not only furnish fuel ready to insert in their reactor but who would also cart away the irradiated fuel, and arrange for having it processed. The utility cannot do this at present because the authority we now have in section 161m of the act disenables the Commission from contracting with such a fuel supplier to perform the necessary reprocessing. It would be a convenience to both the utility and to the Commission if we could do business with such a fuel supplier. Therefore we ask that section 161m be amended to give us the long-term authority to make such contracts.

Another example of where a change in this section of the law would help is in the area of handling fuel for research reactors. These reactors use such a small amount of fuel that they run up against our minimum charge for processing. The result is a relatively high charge. This charge could be lowered for an individual reactor operator if he could turn his irradiated fuel over to a fuel company which would collect fuel from several such small reactors and offer all of it to us to reprocess as a single batch. The result could be a substantially lower charge to each reactor operator and thus a direct benefit to research.

Several companies are exploring the field and at least one fuel element manufacturer is eager to provide a complete fuel service.

(The following telegram was received by the Joint Committee from L. L. Davenport, president of Sylvania Corning:)

BAYSIDE, N.Y., *August 25, 1959.*

Senator CLINTON ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Washington, D.C.:

I have just learned that the Joint Committee is conducting further hearings on S. 2569 and H.R. 8754 including proposed modification of section 161m of the Atomic Energy Act to permit the AEC to enter into long-term contracts with persons other than holders of section 103 or 104 licenses. As pointed out in my written statement of February 16, 1959, to the Joint Committee in connection with 202 hearings and again in my oral and written presentation before the Joint Committee on April 30, 1959, Sylcor is presently engaged in discussions with utilities which if successful could result in our company undertaking arrangements for handling of spent fuel elements including transportation to existing reprocessing facilities. We have eventually to be able to reprocess such elements in facilities of our own. Unfortunately this is not economically feasible at this time. Until such time as it is economically feasible to establish our own facilities we will have to negotiate with existing Government facilities for long-term contracts for actual reprocessing if we are to be able to fulfill our proposed commitments. To enable us to do this we feel it is essential that section 161m of the 1954 act be amended to permit the Commission to enter into such long-term contracts with companies such as Sylcor who do not hold section 103 or 104 licenses. Our present plans for undertaking services in connection spent fuel elements preliminary to eventual full entry into reprocessing field are necessarily conditioned upon such an amendment to section 161m. Favorable consideration by Joint Committee will be very much appreciated.

SYLCOR,
L. L. DAVENPORT, *President.*

Section 2 of the bill contains language which will accomplish these purposes and I urge passage of this amendment at this session of Congress.

Section 3: Section 3 of S. 2569 and H.R. 8754 would amend 163 of the Atomic Energy Act so as to enable General Advisory Com-

mittee members who are from the university world to serve without regard to certain of the conflict-of-interest statutes. The bill also covers members of other advisory boards established by the Commission under section 161(a) of the act.

Members of the GAC are presently subject to technical conflict of interest problems under a possible construction of the statutes (18 U.S.C. 281, 283, and 284) from which section 163 provides a partial exemption. Most troublesome of the statutes is 18 U.S.C. 281 which, as modified by section 163, prohibits an AEC employee from receiving compensation for any services rendered in relation to any matter which is before the agency and in which the AEC is directly involved or interested. The crime is the receipt of compensation, regardless of the type of services rendered.

The Commission's interest in a broadened exemption is occasioned not so much by the fear of any actual prosecution of a GAC member for these technical conflicts than by a desire to clarify what is undoubtedly a hazy area. We want to be able to assure men from private life that they are violating neither the letter nor the spirit of these laws.

In reference to the specific proposal contained in section 3 of your bill, we feel that it is extremely salutory and we support it fully. We have no doubt that the receipt of compensation from nonprofit educational institutions, whose basic motivation is the public interest, is not incompatible with service on the General Advisory Committee or other advisory boards.

Mr. McCone. You indicated you wanted to question on section 91. I would be happy to answer any questions.

Chairman Anderson. We will ask the other people.

Mr. McCone. What we seek in section 91a. is a clarification of our responsibilities in the handling of bombs and other devices that are actually turned over to the Department of Defense by order of the President.

Chairman Anderson. The question is this: Should the proposed new subsection be limited to atomic weapons under the Department of Defense cognizance, and not apply to military reactors?

Mr. McCone. No, that is not quite the question.

Chairman Anderson. It is the question I wanted to ask you. You are saying you ought to be relieved of responsibility, that on these materials turned over to the Department of Defense, weapons and so forth, they should have the responsibility for safety. What about a military reactor? Should they not assume responsibility for that?

Mr. McCone. Yes, they should assume responsibility for a military reactor submarine or aircraft carrier.

Mr. Toll. As drawn, the bill would cover both weapons and military reactors. The question might be asked: Should there be a difference between the two? Would it be reasonable to say the Department of Defense should have responsibility over weapons but perhaps the AEC should maintain the existing practice of reviewing standards over reactors?

Mr. McCone. The bill has that flexibility in it, Mr. Toll.

Chairman Anderson. You said in your statement:

> Problems could also arise in the reactor field if the Department of Defense concluded it could not adopt public health and safety procedures and practices deemed necessary by the Atomic Energy Commission.

Mr. McCone. That is correct.

Chairman Anderson. In other words, if you thought certain requirements were necessary on a military reactor, if this bill is passed, the Department of Defense can just tell you to pay attention to your own business?

Mr. McCone. That is correct.

Chairman Anderson. They will run them whether you like it or not?

Mr. McCone. That is correct.

Chairman Anderson. In view of the fact there is same responsibility, do you not really think that is a pretty broad statement?

You say on page 10 of the report of the Atomic Energy Commission:

> It can be anticipated that, as atomic weapons, nuclear propelled vessels and other military reactors in the custody of military departments become more numerous, the requirements of military readiness in training and maneuverability may exert more and more influence toward less restrictive safety procedures. Under such circumstances, there is no room for doubt as to which agency has the authority and responsibility for dealing with matters of public health and safety.

You are going to just turn these matters over to the military and not hold any yardsticks over them, even the yardsticks the AEC deems to be necessary. It may be a desirable thing, but it is a pretty broad delegation, do you not think?

Mr. McCone. Yes, it is. Of course, the DOD is a responsible agency. But the way that the law is now written there is considerable question as to the agency responsibility for the operation of the submarine, for instance.

Chairman Anderson. I agree with that, and I think you ought not to be held responsible for the results of another's bad management.

Mr. McCone. That is what I want.

Chairman Anderson. But I do think design of the reactor ought to be still within the field of your competency.

Mr. McCone. That is perfectly agreeable.

Chairman Anderson. And safety regulations for operating it.

Mr. McCone. Yes.

Mr. Ramey. Would there be any objection, then, to provide in the language that the Department of Defense would be responsible for issuing the standards and administering them, but the issuance of the general standards would be subject to AEC approval?

Mr. McCone. That would be all right.

Chairman Anderson. That is all we are trying to do.

Mr. Ramey. That would be all right on weapons also?

Mr. McCone. It would be all right on weapons also.

Chairman Anderson. That is very helpful because the problem of the NS *Savannah*, as I saw it, we did have the question of how people can go ahead without regard to other individuals. I speak only for myself, but I think the Atomic Energy Commission has been extremely careful in setting up its standards for the operation of reactors. I would hate to think the military could then say, "That is all right for the Atomic Energy Commission but we are going to do it as we see fit."

Once the standard has been set, they should be responsible for the way they are handled and administered, but I do believe you have the responsibility for the standards.

Mr. McCone. That would be a perfectly agreeable arrangement. We could approve standards but then the administration of them and

conformance with them, or failure of conformance, would be the responsibility of the Department of Defense.

Chairman ANDERSON. That is very helpful.

Are there additional questions of the chairman before he has to go? We apologize for keeping you.

Mr. MCCONE. That is all right. I am sorry I have to go.

Chairman ANDERSON. Who is the next witness? Who is representing the Department of Defense?

Colonel SHANKEL. I am.

Chairman ANDERSON. State your name for the record.

STATEMENT OF COL. WILLARD M. SHANKEL, OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE FOR ATOMIC ENERGY

Colonel SHANKEL. I am Colonel Shankel, military assistant to General Loper, assistant to Secretary of Defense for Atomic Energy. General Loper had an unavoidable conflict on requirements of his time this morning and was very sorry he had to leave. He had no prepared statement. However, he has authorized me to make the following statement for the Department of Defense.

The purpose of the bills is to clarify the provisions of the Atomic Energy Act which apply to the responsibility for the establishment of standards or instructions applicable to the special nuclear material, atomic weapons, or utilization facilities manufactured by, produced, or acquired by the Department of Defense pursuant to section 91b. of the act.

It seems clear that when such materials, weapons, or facilities are acquired or used by the Department of Defense, the Department is necessarily responsible for the observance of adequate and proper measures in the handling, transportation, and storage to protect health and minimize danger to life and property.

Whether the Atomic Energy Commission has the full responsibility for the establishment of the standards and instructions to be observed by the Department of Defense is the question raised by section 161 b. and i. of the act. In the past we have worked out the problem to our mutual satisfaction, we believe, by procedures which have been described by the AEC witnesses. The Department believes it desirable that responsibility for the establishment of standards, regulations, and instructions in the care of material produced or acquired under section 91 b. be clarified and believes that the amendment proposed by H.R. 8754 of August 20 and S. 2569 of August 19, 1959, is satisfactory for that purpose.

The Department of Defense therefore fully supports the amendment to the act proposed by section 1 of S. 2569 and H.R. 8754.

Chairman ANDERSON. Could I ask you this one question. You started off, as I heard it, by saying that General Loper did not have any prepared statement but he authorized you to make the following prepared statement. Can you explain that to me?

Colonel SHANKEL. This is not a prepared statement in the terms of General Loper.

Chairman ANDERSON. Did you not read it word by word?

Colonel SHANKEL. Not to submit 24 hours in advance in accordance with your requirements. General Loper passed this to me to give to you for him.

Chairman ANDERSON. And you thought, since it was written out, it was not prepared. I do not follow you.

Representative PRICE. I notice it is handwritten and apparently hastily prepared to take care of the situation.

Chairman ANDERSON. I was wondering if there was some technicality we would later run into, that the Department of Defense did not subscribe to your statement because it was not a prepared statement. Who prepared the statement?

Colonel SHANKEL. As I said, Senator, General Loper, due to the fact he could not stay and be a witness here this morning, wrote this out in longhand and gave it to me and authorized me to give it for the Department of Defense.

Chairman ANDERSON. He prepared the statement, General Loper?

Representative VAN ZANDT. While he was sitting there.

Colonel SHANKEL. General Loper wrote the statement, yes.

Chairman ANDERSON. I am just trying to find out what weight we should give it. If it is his statement, it is his statement. All right. Are there questions?

Do you agree with what Mr. McCone said, that he thought it would be all right for the AEC to approve standards for the handling of these weapons for safety reasons and for operation of reactors and then the Department of Defense to administer those things?

Colonel SHANKEL. I am not prepared to answer that, Senator Anderson, not for the Department of Defense. I will be glad to get a Department of Defense position on it and pass it to you at the earliest possible time.

Chairman ANDERSON. We are trying to report out a bill and we would like to have the Department of Defense comment on it.

Colonel SHANKEL. I understand the questions you asked Mr. McCone and understand his answer, and I will be glad to get you a Department viewpoint on that right away.

Senator AIKEN. Mr. Chairman, I was curious to know, if this had been a prepared statement, how many people in the Department of Defense would have had to have cleared it.

Colonel SHANKEL. Senator, if there is a question on that, I am sure also the Department of Defense would be glad to put this in in a formal manner, prepare it as a Department of Defense prepared statement.

It did not get here 24 hours in advance, as I say.

Chairman ANDERSON. We very frequently have that 24-hour rule not observed. We had that breach yesterday and no questions were raised. We made an unusual request and made it impossible for the AEC to comply. It was not done purposely. They very graciously came over and presented the statement and gave us a copy. There was not any argument.

Colonel SHANKEL. In that case, we will get it as fast as we can.

Chairman ANDERSON. If you find it agreeable, we will let it appear as General Loper's statement from the military department. I did not want to get in the situation that, if we reported the bill favorably, we would have somebody say, "We understand the Department of Defense never agreed to this, just made some casual comments to it the other morning."

Are there any questions?

Thank you, gentlemen. The witnesses will be dismissed.

(Subsequent correspondence relative to S. 2569 follows:)

OFFICE OF THE SECRETARY OF DEFENSE,
Washington, D.C., August 27, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. CHAIRMAN: As you requested on August 26, 1959, I am forwarding herewith, in the format of a prepared statement, the Department of Defense position given for me by Colonel Shankle during your hearings on August 26, 1959. Since the hearings are now over, only two copies are provided. I hope this is satisfactory.

Sincerely yours,

HERBERT B. LOPER,
Assistant to the Secretary of Defense (Atomic Energy).

STATEMENT GIVEN TO THE JOINT COMMITTEE ON ATOMIC ENERGY FOR GENERAL LOPER BY COLONEL SHANKLE, WEDNESDAY, AUGUST 26, 1959

The purpose of the bill is to clarify those parts of the Atomic Energy Act which apply to the responsibility for the establishment of standards or instructions applicable to special weapons material, atomic weapons or utilization facilities manufactured by, produced, or acquired by the Department of Defense pursuant to section 91(b) of the act.

It seems clear that when such material, weapons, or facilities are acquired or used by the Department of Defense, the Department is necessarily responsible for the observance of adequate and proper measures in the handling, transportation, and storage to protect health and minimize danger to life and property.

Whether the Atomic Energy Commission has the full responsibility for the establishment of standards and instructions to be observed by the Department of Defense is the question raised by section 161 (b) and (i) of the act. In the past we have worked the problem out to our mutual satisfaction, we believe, by procedures which have been described by AEC witnesses.

The Department believes it desirable that responsibility for the establishment of standards, regulations, and instructions in the care of material produced or acquired under section 91(b) be clarified and believes that the amendment proposed by H.R. 8754 of August 20, 1959, and S. 2569 of August 19, 1959, is satisfactory for that purpose. The Department of Defense, therefore, fully supports the amendments to the act proposed by section 1 of S. 2569 and H.R. 8574.

OFFICE OF THE SECRETARY OF DEFENSE,
Washington, D.C., August 28, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. CHAIRMAN: Pursuant to your request I have reviewed the suggested revision furnished informally by the Joint Committee on Atomic Energy staff (copy attached) of S. 2569 arising out of testimony by Atomic Energy Commission witnesses before your committee on August 26, 1959.

I understand that the main objective of section 1 of S. 2569 was to clearly fix responsibility for the development of standards and instructions applicable to special nuclear material or atomic weapons or utilization facilities manufactured, produced, or acquired by the Department of Defense pursuant to section 91 b. in order to protect health and minimize danger to life or property. As stated in my letter of August 26, the Department of Defense fully supported this concept and the language of S. 2569 to accomplish this.

Inasmuch as the proposed revision would place the approval authority with respect to general standards for utilization facilities in the Atomic Energy Commission, it would appear that the objective of fixing responsibility would not be fully accomplished. Therefore, the Department of Defense prefers the language of S. 2569 as introduced by you.

Under the circumstances, the Department would not object to the suggested revision provided it is clearly understood that the general standards which would

be subject to approval by the Commission related only to the military reactor elements of utilization facilities, and that in the event of a disagreement between the Commission and the Department of Defense the issue could be referred to the President for resolution in accordance with section 27 of the act.

Sincerely yours,

HERBERT B. LOPER,
Assistant to the Secretary of Defense (Atomic Energy).

d. Notwithstanding [any other provision] *section 161* of this act, in the event there is a delivery to the Department of Defense, pursuant to subsection b. (1) of this section, or manufacture, production, or acquisition by the Department of Defense, pursuant to subsection b. (2) of this section, in accordance with a directive issued by the President under subsection b. of this section, the President may, to the extent he deems necessary in the national interest, authorize the Department of Defense to establish and prescribe *general and detailed* standards, [or] *and* instructions, applicable to special nuclear material or atomic weapons so delivered or atomic weapons or utilization facilities so manufactured, produced, or acquired, in order to protect health and minimize danger to life or property: *Provided, That such general standards for utilization facilities shall be subject to approval by the Commission.*

STANFORD ACCELERATOR PROJECT

Mr. MCCONE. I would like to speak again of the need for authorization of the Stanford linear accelerator during this session. This is an important research tool, the backbone of the Stanford high energy physics research, and therefore should be authorized. The group assembled there is ready to proceed.

As this committee knows, the AEC was formally given responsibility for this project only a short time before it was publicly announced. We immediately made checks of the engineering studies and proposed costs in such detail as time permitted.

I have visited Stanford, have been over the project area, and talked to the Stanford people. I have no specific reason to question the studies or cost estimates. However, I have ordered a complete recheck of these studies, particularly the likelihood of earthquakes. We are now proceeding with the necessary engineering reviews and drilling within the area. These results will be in our hands before substantial commitments for detailed engineering and construction are made. All indications are that the estimates are reasonable.

I should like to emphasize that the requests submitted to Congress constitute a complete project. I have been assured that the proposed accelerator represents a complete facility in the sense that additions will not be necessary in order to carry out the work planned at this time.

A question has been raised as to whether the cheap power from Bonneville can be used to supply the needs of this accelerator. We are reviewing this but I respectfully suggest that it will be some time before we will be ready to use this power and several years before we need to arrange for it. Surely a mutually satisfactory arrangement regarding power can be made in the time which remains before power contracts are negotiated. I can assure you that no commitments will be made for power until we have exhausted our efforts to procure the cheapest power.

I hope that the committee will consider this request and authorize this project.

That concludes my statement.

Chairman ANDERSON. Mr. Chairman, on the Stanford accelerator, we wrote to Stanford and asked them what connection this had with the royalties on the Varian tube and Stanford replied it would waive its share of the royalties. But Stanford advised us that of whatever royalties come in, Sperry Gyroscope gets 50 percent, and of the remaining 50 percent, Stanford gets 45 percent, the Varian brothers, as individuals, get 45 percent, and the Hansen estate gets 10 percent.

Representative VAN ZANDT. What do the royalties run?

Chairman ANDERSON. $4 million thus far on something that, as I understand, was developed in the laboratory in which the Government had some contributing interest and now would put in a substantial amount of money to further the progress of this.

Mr. MCCONE. This is one of the points I developed when I visited Stanford. The royalty is on the Klystron tube. It was developed at Stanford University by a Dr. Hansen, who has since passed away, and the Varian brothers at the cost of the university with no Government assistance, and the patents were issued.

The tube made important contributions to radar, and so forth, and consequently the Government has taken a very substantial interest in improving it. But, nevertheless, the basic development was made, as I am told, at Stanford prior to any Government participation.

Chairman ANDERSON. Prior to any Government participation?

Senator HICKENLOOPER. That was done in about 1940, was it not?

Mr. MCCONE. It started in 1939, Senator. I became a little concerned, and the information you just read out, Senator Anderson, was the result of an inquiry I made to Dr. Sterling. He offered to waive the Stanford participation. I, frankly, know of no particular reason why they should do that.

Representative HOSMER. The patent is about to expire anyhow, is it not?

Mr. MCCONE. I do not know the dates on them. They do receive royalties on Klystron tubes that are sold to the Department of Defense and others. General Luedecke has a letter——

Chairman ANDERSON. I have just received his letter. It is not dated. Should it be dated today?

General LUEDECKE. Yes.

Mr. MCCONE. The letter states the amounts of the royalties that will accrue not only to Stanford but to the others in the proportions indicated by Senator Anderson.

Chairman ANDERSON (reading):

The first order on the accelerator involves royalties for $45,000, if Stanford does not waive its share, or $34,875 if Stanford does waive its share of the royalties.

Once the Navy is in operation, the annual procurement of any Klystrons is estimated at 55 and repair existing Klystrons is estimated at 1,025. The royalty payments for the new Klystrons and repair parts would total approximately $33,250 if Stanford does not waive its share and $25,800 if Stanford does waive its share.

Senator HICKENLOOPER. How does that add up if Stanford gets 50 percent?

Mr. MCCONE. It gets 45 percent of 50 percent.

Chairman ANDERSON. Stanford gets 45 percent of 50 percent?

Senator HICKENLOOPER. I see.

Chairman ANDERSON. Sperry Gyroscope owns half. How they got into it I do not know.

Then we have a long AEC letter on royalties which it might be well to put in the record at this time.

(The letter follows:)

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., August 19, 1959.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: Your letter of August 5, 1959, inquiring as to certain patent aspects of the Stanford linear accelerator proposal, is acknowledged.

It is believed that you will appreciate that the technical aspects of the accelerator are only in the formative stage and that it may be several years before detailed decisions will be made as to its design or the components to be incorporated therein.

During the past several years there have been a number of items conceived during the course of developments under the Stanford Atomic Energy Basic Research Contract At-04-3-21 which, if proven in future research, might constitute important components to be incorporated in the accelerator. The Commission, by virtue of the patent provisions of said contract, would acquire the rights in any such developments that have been made in the course of said contract. There may be some items developed under a Navy research contract with Stanford as to which the Government would acquire a governmental license. There may also be other items privately developed and owned which may be incorporated in the linear accelerator. However, it is not believed possible to identify any specific items at present, since, as noted, no final determination as to the particular components to be employed has been made.

At present, one significant item proposed for use that is covered by privately owned patents, is the klystron tube. It is to be appreciated that there may be other components that will be selected for inclusion that would be the subject of privately owned patents.

It is understood that the basic developments in the klystron were made by Stanford investigators prior to any Government-sponsored work and that a considerable number of patents have been secured by Stanford and Sperry Gyroscope Co. (now a division of Sperry-Rand Corp.) on such component. Certain work at Stanford, starting sometime in 1938, was sponsored by Sperry. Sperry and Stanford in March 1946 negotiated an agreement, nullifying an earlier 1938 agreement, under which Sperry acquired the exclusive administration of the licensing of the klystron patents. Sperry has granted licenses to make and sell klystrons at 3-percent royalties. Stanford's share of royalties was 1½ percent on all klystrons until January 1, 1956. After extensive negotiations, the Defense Department entered into an agreement on January 1, 1956, with Sperry, Stanford and Raytheon, under which, in addition to settling for $276,441 for past Government infringement, Sperry and Stanford agreed that future royalties on klystrons for Government end use would be at the rate of 2½ percent. Therefore, should klystrons be employed, and in the absence of any other arrangement, the Atomic Energy Commission may very well be obligated to pay Sperry licensees the 2½-percent royalty on klystrons.

President Sterling of Stanford has advised Chairman McCone that Stanford would, if necessary, consider waiving its share of the klystron tube royalties for those tubes purchased by Stanford under the proposed contract. It is understood that 50 percent of all royalties is retained by Sperry and that of the 50-percent royalties coming to Stanford its share is 45 percent, the balance being distributed in designated portions to the Hansen estate and the Varian brothers, as individuals.

No specific contract negotiations have been undertaken with Stanford as to the patent provisions to be incorporated in the contract. The Commission will expect to employ the same type of provision in the development and operation contract as has been employed in other research, development, and operating contracts, namely a type A patent article. The type A patent article has been incorporated in other research and development contracts with Stanford. It is anticipated that the Commission will hold Stanford harmless as respects research, development, and operation, the same as other contract operators of Commission installations, subject to such contract operators securing patent indemnity in favor of the Government as respects standard parts and components purchased and employed in the contract work. If research and development is

to be conducted on specific components that are the subject of Stanford patents or patent applications, the Commission will employ background license provisions covering such items or components to the extent that Stanford can grant the same without payment of royalties. It is recognized that if it is necessary to conduct research and development on the klystron tube, that it may not be possible to secure more than a waiver from Stanford of its share of royalties under existing Stanford agreements.

I trust that the foregoing information is a satisfactory response to your inquiry.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C., August 5, 1959.

Gen. A. R. LUEDECKE,
General Manager, U.S. Atomic Energy Commission,
Washington, D.C.

DEAR GENERAL LUEDECKE: We would like to receive information on the subject of patents relative to the proposed Stanford linear electron accelerator project. Specifically we would like to know what significant items proposed to be used in the accelerator are patented, who holds the patents, and what the Government's liability may be relative to fees or royalty payments for the use of such patents or patented devices. For example, we would like to know the patent situation with respect to the klystron tubes.

We would also appreciate information on what kind of patent article will be used in the contract for the development and operation of the linear accelerator, including the handling of background patents, if any.

Sincerely yours,

JAMES T. RAMEY,
Executive Director.

Chairman ANDERSON. In other words, if the accelerator is built it will depend upon the use of these tubes on which a royalty is paid to Stanford University?

Mr. MCCONE. That is correct.

Chairman ANDERSON. And Sperry Gyroscope and these individuals also?

Mr. MCCONE. That is correct, and the Varian brothers and the Hansen estate.

In my inquiry, I wanted to know whether any part of the royalties went to any individuals connected with Stanford University, and I found it did not.

Representative VAN ZANDT. Isn't this a rather unusual arrangement?

Mr. MCCONE. No, the payment of royalties is not unusual.

Chairman ANDERSON. On devices developed at a university?

Mr. MCCONE. On devices developed at a university.

Representative VAN ZANDT. With private money?

Mr. MCCONE. With private money.

Chairman ANDERSON. Was this developed with private money?

Mr. MCCONE. It is my understanding, sir, this was developed, started in 1939, with private money before the Government became interested.

Chairman ANDERSON. With Stanford University money but not private money; is that right?

Senator BENNETT. Mr. Chairman, Mr. Hosmer and I went out to Stanford, and my memory of what we were told is that all Stanford contributed was the use of the laboratory and $200 or $300 worth of

equipment. The Varian brothers had been graduates of Stanford, they had had this idea, and they worked in and out of the laboratory as private citizens. Stanford did contribute the intangible value of the informal supervision of Dr. Hansen for their development. They brought their ideas to him and he said, "No, it will not work," and so they went off and developed a new idea. But they were not employees of Stanford, they were privates citizens, alumni of Stanford who, because of being alumni, had been given the courtesy of using some Stanford laboratory material.

Senator HICKENLOOPER. I remember reading about this development prior to World War II. As I recall it, it had a great deal to do with the rapid advancement of radar.

Mr. MCCONE. That is correct.

Senator HICKENLOOPER. In fact, this is based on radar principle and kind of a forerunner of radar operation. My recollection is it was developed practically independently of anybody with the exception perhaps of some laboratory facilities which were used, and I expect Sperry Gyroscope took over the development of this and perhaps in return received assignment of a certain portion of the royalties.

Senator BENNETT. I think the Varians went to work for Sperry Gyroscope afterward.

Representative HOSMER. That is correct. These two people went out and started to look for something that turned out to be named radar. As Senator Bennett says, they were Stanford graduates and kicked around the campus there. I think the university told us they figured they took copper wire and lot of junk around there of some value in doing their experiments and took up a lot of Dr. Hansen's time, and everybody became intrigued about it, and it was sort of an extracurricular activity around the shop. They finally came up with the idea. It looked good, and they played around with it and did as much as they could at the university, got the patent, and got into the developmental stage, and then the Varians went off with Sperry, who had the facilities actually make some practical application of it.

Then, in gratitude to the university and as a quid pro quo for helping to kick around their ideas and using their laboratories, they assigned their ownership that they had left after they made this deal with Sperry, which was 50 percent, to the university with the proviso that they got part of the proceeds and the Hansen estate got part of the proceeds, and 45 percent of the 50 percent was left to the university, as the chairman says. That is where it sits and where it has been for a number of years.

I talked with one of them out there and asked, "How much longer do you have to go on the patent?" They indicated 2 or 3 years. I think we should keep that in mind since it is not going to get into operation for 5 years and, after the initial purchase of tubes, those royalties are not going to be payable anyway. But to protect ourselves, any development on these tubes which is going to be made will probably become merely patentable items, and we can then protect the Government on that, of course.

Chairman ANDERSON. That confuses me on the general's letter, because that is talking about the first installation and subsequent repairs, and the first installation, you say, will not be for 5 years?

Representative HOSMER. I may be in error. The patents may be renewable.

Chairman ANDERSON. Certainly.

Representative HOSMER. Probably there may be a series of patents.

Senator HICKENLOOPER. There may be improvements.

Chairman ANDERSON. That is one thing the accelerator will do, keep on improving the tubes.

Representative HOSMER. It is not enough of an amount of money that anybody could point their finger and say that is the only reason they want to build it out there.

Senator HICKENLOOPER. You have a lot of basic patents today that have been long outlawed, but the improvements on them which inhere into the modern device are such that if you want to use the basic patent you can, but you have an antiquated operation.

Mr. MCCONE. I think you will find there has been a series of improvement patents made, because you go out there and go through their laboratory, and you will see one device after another, and this one they did in 1939, and this one they did in 1944, and so forth. Each one is an improvement over the other one.

Chairman ANDERSON. Then this is going on in the Stanford laboratory, and the accelerator will continue to improve them.

Mr. MCCONE. I questioned them as to their laboratories. They have some nice laboratory buildings. I said, "Did the Government build these buildings?"

They said, "No; we built them."

I said, "Your trustees treat you pretty nicely. They do not usually dish out money like this for specialized work."

They said, "They like it because they get the royalty. So they put the royalty money into laborator buildings."

Senator BENNETT. Is it not also true that one of the Varian brothers is on the board of trustees of Stanford at the present time? I am not sure of that.

Representative HOSMER. I am not, either.

Senator BENNETT. But the Varian brothers have built industrial facilities on the Stanford campus on a 99-year lease.

Representative HOSMER. Whatever the royalties to these particular sales to the accelerator are, they are fractions in relation to the total royalties the Government is paying for radar. The Navy and everybody else that has radar are eventually paying a few pennies back to the patentee.

Representative WESTLAND. Mr. Chairman.

Chairman ANDERSON. Mr. Westland.

Representative WESTLAND. I have one comment to make about the so-called cheap power from Bonneville. As I recall the previous testimony on this linear accelerator, it would need about 60,000 kilowatts of firm power.

Mr. MCCONE. That is correct.

Representative WESTLAND. We do not have surplus power in the Pacific Northwest, except at certain times we have so called dump power or interruptible power, which I doubt would be agreeable to this accelerator for its use because of the fact it would be interruptible. But the proposition of bringing 60,000 kilowatts of firm power down from Bonneville to Stanford would certainly be the subject of con-

siderable debate because we, in the Pacific Northwest, sort of feel that we have proprietary rights on that power, and we expect to use it in the development of the Pacific Northwest.

There has been quite a little hassle already over this thing over whether it was going to be a 220-line, as proposed by the Pacific Gas & Electric Co., or whether a 440-line as proposed by some other applicant.

I think the Commission, in figuring out its power costs on this, would be wise to certainly consider alternative power sources through the Federal Government, through the Bureau of Reclamation, and the Army Engineers who have put hundreds of millions of dollars in the Central Valley project. I think the Trinity River project has just had appropriated for it $3½ million to get that show on the road. Whether or not that actually will occur, I am not too sure. There has been certainly considerable debate on that one.

Another thing is that for the first time in the history of Bonneville power, it was in the red this last year. Always previously it had been in the black. So perhaps this cheap power may not be quite as cheap as it has previously been.

Dr. Paul Raver, when he left the Bonneville Power Administration back in 1952, wound up his term of office by saying that the 17.50 weight should be increased to 22.50. It has not been done.

The Bonneville Power Administration is now in the red, and it is quite possible that rate will be increased.

I just throw that in for consideration of the Commission in figuring out their power costs on this thing.

Mr. McCONE. Mr. Westland, when this matter was brought up during the hearings, I merely wanted to point out to the committee that we have gone into it and find it is a very complicated problem. This is 60,000 kilowatts of firm power. It is important that we buy the power as cheap as we can because 1 mill runs about $450,000 a year. So it is a big item. We are going to go down every road on this, of which Bonneville Power is one. I realize one of the big obstacles of the many is the fact this has to be firm power.

Chairman ANDERSON. I agree that the possibility of power from Bonneville has to be carefully examined. Personally, I think that Trinity is a more likely source.

Representative VAN ZANDT. Where is Trinity?

Representative WESTLAND. Northern California. It is about 9-mill power.

Chairman ANDERSON. The only reason I mentioned it at all, we are just being pressed in the Interior Committee to approve an intertie with Pacific Gas & Electric, in which they are pointing out they have large possibilities of use of 60,000 kilowatts. I thought if one is going to supply 60,000 kilowatts and the other is going to use 60,000, it seems to have more of an intertie than just the line. I want to check it all. I think what the chairman said is completely right—you take your time and look at it.

Now, the general questions. Are there questions?

Representative VAN ZANDT. Mr. Chairman, I would like to ask Mr. McCone a question on this Stanford accelerator.

As I understand it, you are recommending we report out the authorization bill?

Mr. McCONE. That is correct.

Representative VAN ZANDT. At this session of Congress?

Mr. MCCONE. That is correct.

Representative VAN ZANDT. As a result of your personal study at Stanford, the real estate problems and royalties, and so forth, have been fully investigated, and your study of the Bonneville power is continuing?

Mr. MCCONE. That is correct.

Representative VAN ZANDT. And you should have a firm answer for us probably some time during the next session?

Mr. MCCONE. Yes. There are two, actually three areas that concern me as a result of my personal investigation. In the first place, I wanted to be absolutely sure there was no earthquake hazard.

Representative VAN ZANDT. No what?

Mr. MCCONE. No earthquake hazard. The San Andre fault is nearby. We have been given assurances of some very knowledgeable people, and there are reports in existence which are quite convincing. Nevertheless, three consulting geologists each recommended that certain exploratory drilling be done, and we have ordered this work be done and it is proceeding now.

Chairman ANDERSON. That is what is a little difficult. You ask us to authorize the project before the drilling is done.

Mr. MCCONE. The only effect will be, in our opinion and my opinion, in the degree of reinforcing and earthquake resistance construction to build into it.

There seems to be no question that you have a situation that is unsafe. There are tunnels in the immediate vicinity, within a half a mile, of the San Francisco waterworks that have been in existence for a great many years. But nevertheless we are investigating that thoroughly.

The second point I wanted to be sure about was that we had a complete facility here, that they did not come out and say, "Fine. You have the tunnel, you have the accelerator, you have one building, but we need all the rest of these things," and we would be facing the continual problem of authorization and appropriation in order to make a complete facility. I received assurances on that.

It may be that this will develop other applications which are not provided for, but the facility is complete for the existing application of this accelerator.

The third point is the question of the estimated cost. We have two, really three estimates. They are reasonably close one to the other. The one made by Stanford is on the low side, and the one made by the consultants conforms reasonably to the $105 million figure mentioned in the authorization bill. We want those rechecked very carefully.

They may be affected in some way by these design features which I mentioned. However, all of the estimates have substantial contingency items in them and also substantial items for escalation during construction. I have no reason to say at this time that they are inadequate, but I just want to be sure.

Representative VAN ZANDT. Mr. Chairman, I have one more question.

Did you take another look at the possible legal entanglements concerning the real estate on which this accelerator will be located?

Mr. McCone. The proposal is that a certain area on the Stanford campus, which involves the tunnel right-of-way and 200 acres at the mouth of the tunnel to provide the facilities, will be dedicated for this purpose and will be leased on a long-term lease of a dollar a year. It is impossible for Stanford to sell us the property or deed us the property because of the background of the grant from Leland Stanford to the university establishing it. But we will have access to the property as though we owned it in fee for a long period of time.

Representative Van Zandt. Do I understand the Stanford University has a clear deed on all this property which they will lease to us on the basis of a dollar a year?

Mr. McCone. It is my understanding that the property is in the Foundation of Stanford University. The Stanford Foundation that created the university has a clear deed to the property. We have not, I would say, Mr. Van Zandt, examined every legal document. We will do so, of course, in the course of this negotiation. We have agreed with the Stanford people in principle.

Chairman Anderson. I do not say there is any great problem over this royalty. I do want to read a paragraph of the letter and let the members see what the complications are. This is the letter from General Luedecke, dated August 19.

> No specific contract negotiations have been undertaken with Stanford as to the patent provisions to be incorporated in the contract. The Commission will expect to employ the same type of provisions in the development and operation contract as has been employed in other research, development, and operating contracts; namely, type A patent article. The type A patent article has been incorporated in other research and development contracts with Stanford. It is anticipated the Commission will hold Stanford harmless as respects research, development, and operation the same as other contract operators of Commission installations, subject to such contract operators securing patent indemnity in favor of the Goverment as respects standard parts and components purchased and employed in the contract work. If research and development is to be conducted on specific components that are the subject of Stanford patents or patent applications, the Commission will background license provisions covering such items or components to the extent that Stanford can grant the same without payment of royalties.
>
> It is recognized that, if it is necessary to conduct research and development on the Klystron tube—
>
> the matter in argument—
>
> that it may not be possible to secure more than a waiver from Stanford of its share of royalties under the existing agreement.

In other words, whatever we do in the way of research in this project will be for the benefit of Sperry and will be for the benefit of the Hansen estate and will be for the benefit of the Varians, and the most Stanford will lose—and it is not willing to agree to that in advance—it may waive its own royalties later, but it is not yet agreeable to do so. And we are going to spend $105 million doing that job.

Mr. McCone. No development out of the accelerator itself will accrue to Stanford or to Sperry or the Varian brothers or the Hansen estate. This refers to improvement patents to the Klystron tube, which is the energy source of the accelerator.

Chairman Anderson. And this will be done in connection with the accelerator, will it not?

Mr. McCone. It will be done in connection with the accelerator and might be done in connection with the Klystron tube used in a radar. There are thousands of these things around.

Senator HICKENLOOPER. I do not see how any royalties accrue to the estate of these people on new developments at all. Existing royalty rights probably will have to be waived, but on any new improvements I do not see how they would accrue.

Chairman ANDERSON. I am only reading the letter.

Senator HICKENLOOPER. They go to the people holding the existing things and——

Chairman ANDERSON. And modifications of it?

Senator HICKENLOOPER. Existing, not future modifications.

Chairman ANDERSON (reading):

It is recognized that, if it is necessary to conduct research and development on the Klystron tube—

this is not referring to what these people may do but in connection with what we may do in connection with this accelerator—

It is recognized that, if it is necessary to conduct research and development on the Klystron tube that it may not be possible to secure more than a waiver from Stanford of its share of royalties under the existing Stanford agreement.

Senator HICKENLOOPER. That is right.

Chairman ANDERSON. So if we spend the Government's money, or they do, in developing the Klystron tube in connection with this accelerator, any royalty that comes to Sperry as a result of that Sperry will get, and we are not sure Stanford will waive it.

Senator BENNETT. That is not what it says.

Senator HICKENLOOPER. Not at all. In other words, if we use the Klystron tube and any existing refinements of that which are now patented or to which any royalty holders are entitled to a patent, if we use it as a basis for further investigation, royalties will be due on the portion which we use which is already patentable and upon which royalties are due. But improvements upon that, going from that point on in the future, I do not believe would be subject to any royalty to these people. Royalties up to a certain point would be due unless they are waived. On existing patented devices, I mean.

Representative HOSMER. Will the gentleman yield?

Senator HICKENLOOPER. Yes.

Representative HOSMER. If there are patentable improvements, the Commission acquires title to them?

Senator HICKENLOOPER. That is right.

Representative HOSMER. If they are not patentable and Sperry manufactures them, they are going to get the benefit or anybody else.

Incidentally, we have a lot of Government research that RCA has been able to pick up and improve its process. Under those circumstances we have been able to get this research in the Government anyway. That is inevitable.

Chairman ANDERSON. Does the Commission have anything to say as to what is going to happen out there? They are planning to conduct research on the Varian tube with the accelerator which will be built with Government money. Do you understand there is any agreement by them to waive royalties on that to the Government in the future or that Stanford will consider the possibility it may waive its royalties?

Mr. MCCONE. I would like to reserve because I have not seen that letter and our patent counsel is not here.

However, it would be my offhand opinion that improvements which are bound to be made to the accelerator—and they will either be made on one of the 240 for this accelerator or in connection with the thousands that they are selling and distributing elsewhere—that they will be patentable and that the owners of the patents will receive royalties on them. That is my opinion.

Senator HICKENLOOPER. Not necessarily the owners of the previous patents.

Chairman ANDERSON. Oh, yes.

Senator HICKENLOOPER. You mean the owners of the Klystron tube will own the patents on the improvements that are made by somebody else?

Mr. MCCONE. No; not that.

Senator BENNETT. May I make the point, Mr. Chairman, there are a number of manufacturers of Klystron tubes. I am sure all of them are working on improvements.

Chairman ANDERSON. Are they not all paying royalties to the Varian brothers?

Senator BENNETT. I understand on the basic tube.

Chairman ANDERSON. But if they improve the Klystron tube the Varian brothers will continue to receive royalties on those improvements?

Senator BENNETT. No.

Representative HOSMER. If the Varian brothers make the thing they pay a royalty.

Senator BENNETT. Let us take an example. Here is Litton Industries. They probably are manufacturing as many Klystron tubes as the Varian brothers, and if they in their process add an improvement to the Varian tube I think, as Craig has said——

Representative HOSMER. They get a patent.

Senator BENNETT. They get a patent. Then Varian, who adopts that improvement for their manufacture of Klystron tubes, must pay Litton.

Chairman ANDERSON. But the research at Stanford is going to be in cooperation with Varian brothers.

Senator BENNETT. Not necessarily.

Chairman ANDERSON. I do not say "not necessarily"; it is.

Senator BENNETT. Is that your understanding?

Mr. RAMEY. Would they not have to have an agreement with the basic patent owner in order to do this research to make improvements, so the patent owner, as a matter of bargaining, would have to work out his arrangements?

Senator HICKENLOOPER. That is your point.

Mr. MCCONE. I would like to submit a statement on this. What I think you will find out is that when Varian Bros. license, let us say, Litton Industries to manufacture klystron tubes and enter the market the agreement would provide that all improvements made by Litton Industries would be the property of Varian Bros. That is what I think. That is a common procedure.

Senator HICKENLOOPER. That is a matter of contract.

Chairman ANDERSON. Everything that comes out of this $100 million will be theirs.

Senator HICKENLOOPER. It is a matter of contract and a matter of agreement. If the Varian Bros. say "you cannot use these tubes unless you agree to give us the patent interest in any improvements," that is one thing. But if Varian Bros. say, "All right, you pay us a royalty on the use of the basic tubes and any improvements you make are not any of our business, they are your business," that is something else. It is a matter of agreement.

Mr. RAMEY. That is right.

Representative VAN ZANDT. Mr. Chairman, may I ask Mr. McCone a question?

Chairman ANDERSON. Mr. Van Zandt.

Representative VAN ZANDT. This is not the first time a situation like this has developed where the Government facility is going to use a device that has been patented and owned by someone, is it?

Mr. MCCONE. No.

Representative VAN ZANDT. You were in the Department of Defense during the period of World War II. Does the Government have a general policy of dealing with a problem like this?

Mr. MCCONE. No, they do not have a set policy. There are variations that accommodate particular situations.

Representative VAN ZANDT. Each individual case has to be negotiated?

Mr. MCCONE. As a general policy, the Government attempts to arrange so it will have the right to all developments made to anything that is financed by public funds. However, there are instances where this involves equipment or devices which have been developed to quite an advanced stage by private funds and the improvements do not necessarily flow out of the Government money but they flow out of the whole background in the art. There is where the problems come up. I just have to find out how it is going to work out.

Chairman ANDERSON. Before you leave, I want to say that personally I am not averse in any way to be putting out the Stanford accelerator bill. I wish it were possible to obtain a statement of some kind on the patent situation. I think the statement of General Luedecke, if I can read, says we are going to have to pay royalty on the things our money develops. I think it is a bad situation. If it comes to the floor that way, I will have to make the statement I do not think that is a desirable thing. I will still let it go ahead, but I do not think it is desirable.

Mr. MCCONE. I will have a statement on it.

(The following letters were subsequently received from the AEC:)

U.S. ATOMIC ENERGY COMMISSION,
August 26, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: In the hearings this morning there was considerable discussion as to the meaning of the last sentence of the next to last paragraph in a letter from me to you dated August 19, 1959, dealing with the klystron tube situation. The sentence reads as follows:

> "It is recognized that if it is necessary to conduct research and development on the klystron tube, that it may not be possible to secure more than a waiver from Stanford of its share of royalties under existing Stanford agreements."

Your question this morning indicated that you thought the above-quoted sentence was ambiguous because it left the impression that the Government might

be obligated to pay royalties on new inventions conceived as a result of the expenditure of Government money. The sentence was not intended to give that impression.

We will include in any contract negotiated in connection with this project a provision that new inventions, including improvements in klystron tubes, which come about as a result of expenditure of Government money be covered by a type A patent article, under which the Government has complete rights. However, the Commission may be obliged to continue to pay royalties in the event that the tubes embody inventions covered by privately owned patents.

I trust that the above explanation clarifies the Commission's position in the matter.

Sincerely yours,

A. R. LUEDECKE,
General Manager.

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., August 26, 1959.

Mr. JAMES T. RAMEY,
Executive Director,
Joint Commitee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: This is in reply to your August 19, 1959, letter requesting information on estimated annual royalties for klystron tubes to be used in the proposed Stanford accelerator.

The initial complement of klystrons totals 300, including 60 spares. The royalty payments on 300 klystrons are estimated at $45,000, if Stanford does not waive its share, or $34,875 if Stanford does waive its share of the royalties.

Once the machine is in operation the annual procurement of new klystrons is estimated at 55 and repair of existing klystrons is estimated at 1,025. The royalty payments for the new klystrons and repair parts would total approximately $33,250 if Stanford does not waive its share, and $25,800 if Stanford does waive its share.

These estimates are based on an estimated cost per new klystron of $6,000, annual repair parts of approximately $1 million and an estimated tube life of 1,000 hours.

Sincerely yours,

A. R. LUEDECKE,
General Manager.

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C., August 19, 1959.

Gen. A. R. LUEDECKE,
General Manager,
U.S. Atomic Energy Commission,
Washington, D.C.

DEAR GENERAL LUEDECKE: The receipt of your August 19, 1959, letter on the subject of patents relative to the proposed Stanford linear accelerator is acknowledged.

We would appreciate receiving estimates of annual royaly costs for klystron tubes for the proposed machine based on the royalty percentages given in your letter. Please supply estimates on the assumption that Stanford waives it share of the royalties and on the basis that Stanford does not waive its share. Also please indicate the estimated cost per tube and estimated tube life upon which the royalty estimates are based.

Sincerely yours,

JAMES T. RAMEY,
Executive Director.

Chairman ANDERSON. One more question before you leave. Is your statement to be regarded in any way confidential to this meeting or is it open for release?

Mr. MCCONE. It is open for release.

Chairman ANDERSON. This is an executive session.

Senator HICKENLOOPER. What statement?

Mr. MCCONE. The one I just read.

Chairman ANDERSON. I am coming now to a second question.

If we bring these bills to the floor, we will have to have some sort of testimony on them. Would your office be willing to take the hearings this morning and indicate to us whether or not they may be printed before the bills come up before us so we have a legislative history when they get there?

Mr. MCCONE. Yes, we will do that.

Senator JACKSON. May I ask one question? I am sorry I was not here when you discussed the Stanford accelerator.

I understand there was colloquy about the Bonneville power. To my knowledge, they do not have any firm power available. The discussion was with reference to availability of secondary power?

Mr. MCCONE. Mr. Westland pointed out that very thing, Senator. This takes firm power and for that reason the Bonneville power may not qualify.

What conclusion we reached, Senator, was, since we are not going to need this power for several years, it gives us time to work out the most economic source of supply that we can develop. One mill at an 80 percent load factor makes a difference of $420,000 a year in operating cost.

Senator JACKSON. It is going to be pretty expensive power down there. What Pacific Gas & Electric is trying to do, they want to buy the secondary power to reduce their high thermal costs during the summer months when they have their heavy load factor. They are only going to use it to reduce their thermal costs, which is about 16 mills, I believe. It is very high. They will get the Bonneville power at 2 mills, you see. It is not for the purpose of adding to their output, they are going to shut down their thermal facilities and utilize the dump power and secondary power under this proposal.

Chairman ANDERSON. Are there any further questions? If not the hearing is adjourned.

(Whereupon, at 12:15 p.m. the hearing was concluded.)

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